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Buzzards Bay Project

BAY WATCH

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Wetland protection: evaluating the tools of the trade

What's a wetland worth? In the past, wetlands have been seen as nothing more than undesirable, bug-ridden, waterlogged parcels in need of filling. But, as we now know, such a view couldn't be farther from the truth. And the benefits of wetlands are not only ecological, but also economic — in fact, it's been calculated by the Massachusetts Department of Environmental Protection that one acre of wetland provides an average of $170,000 in benefits to the Commonwealth.

Indeed, wetlands including bogs, swamps, salt marshes and wet meadows are among the world's most valuable and productive natural resources. These areas perform such crucial functions as keeping our drinking water clean and in ample supply, and protecting our homes and other property from rising flood waters. Wetlands also provide vital habitat and nurseries for fish, shellfish and other wildlife.

But despite their indisputable ecological and economic significance, in Massachusetts, nearly half of the wetlands have been destroyed. Although much of this destruction occurred prior to adoption of the Massachusetts Wetland Protection Act (WPA), it is still occurring at an unacceptable rate — and this is happening in a state long considered to be the national leader in wetland protection.

In 1963, with the passage of a precursor to the WPA, Massachusetts became the first state in the nation to legislatively protect coastal wetlands. This landmark legislation is designed to protect wetland resources and functions by empowering the state and local conservation commissions to regulate any potentially wetland altering activity in or within 100 feet of wetland areas. In 1965, legislative protection was also extended to inland wetlands.

Today, the WPA is still considered to be the nation's most protective law of its kind. So why is the Commonwealth still experiencing a significant rate of wetland destruction? Part of the answer may be found in how the law is enforced and how we use our existing tools of wetland protection. For example:

- Even though the WPA is designed as a minimum statutory standard, many towns are unaware of, or do not take full advantage of their right to adopt and implement zoning and nonzoning bylaws to strengthen protection of local wetlands.
- Significant wetland destruction occurs simply because conservation commissions are unable to accurately delineate exactly what areas are wetlands and in need of protection.
- Productive wetland areas are often filled in exchange for non-functioning wetland replications, in part because commissions do not fully utilize their discretionary power to prohibit or limit such projects.
- And most conservation commissioners concur that simple misunderstanding of the law, as well as local politics, can often interfere with effective WPA implementation.

For this issue of *Bay Watch,* we went to environmental professionals and conservation commissioners who deal with wetland protection issues every day and asked them what can be done to hold the line on wetland losses. In the following pages we'll explore their ideas as to how to make the tools of wetland protection work.

Towns have the power to protect

While some environmentalists may maintain that the Wetland Protection Act (WPA) is not as exacting or stringent as it could be, says McGregor & Shea Environmental Attorney Matthew Mitchell, most environmental professionals see the statute "as an open invitation for municipalities to adopt legislation and draft regulations to meet specific wetland protection needs and goals — it's an opportunity that should not be passed up."

Indeed, the Massachusetts WPA is a minimum statutory standard, and municipalities are empowered to impose more stringent controls on potentially wetland-altering development, so long as these measures are consistent with the Act and the Massachusetts Constitution. Such controls are possible through the adoption of wetland protection zoning and nonzoning bylaws — both of which are powerful wetland protection tools. However, there are profound differences in the kind of protection that each of these mechanisms can provide, as well as a variety of implementation issues that can impact their ultimate effectiveness.

Specificity: the nonzoning bylaw advantage

One of the greatest benefits of nonzoning bylaws is that they can be precisely tailored to protect specific wetland resources and functions. Says Mitchell, "the most effective regulations describe the areas to be protected (for instance: coastal beaches or dunes, tidal flats, barrier beaches or salt marshes), and the particular purposes these areas serve (such as pollution or erosion control, storm damage prevention or providing food and habitat for wildlife). Bylaws usually offer wetland protection by prohibiting any potentially wetland-altering activity, or by expanding conservation commission jurisdiction over the protected area.

Currently, the Buzzards Bay Project is working with several Bay area towns to develop local wetland protection bylaws:

- In New Bedford, the Project is helping to address stormwater runoff problems by writing an ordinance to require that all developments built within 100 feet of wetlands include stormwater control systems to protect water quality.
- For Marion, the Project is developing a bylaw that will expand conservation commission jurisdiction to require that structures be set back specific distances from wetland resources to prevent intrusion into the protected areas; and
- for Rochester, the Project is drafting bylaw provisions to enable the conservation commission to assess review fees for large projects. These funds will be used for professional wetland consultant project review.

Bylaws can further broaden local wetland protection authority by including an expanded "purpose" section, which lists the values that a municipality seeks to protect. For example, the Town of Nantucket's bylaw lists "recreation and wetland scenic views," as protected wetland values. This inclusion of aesthetic values substantially expands the conservation commission's wetland protection power.

WHAT A WETLAND BYLAW CAN DO FOR YOUR TOWN:

▲ Authorize the conservation commission to draft and enforce wetland protection regulations which have the force of law

▲ Protect habitat for certain species of plants and wildlife that are specific to your geographic area

▲ Set more stringent standards for water quality protection, flood and erosion control, and storm damage prevention than those included in the Wetlands Protection Act (WPA)

▲ Broaden the scope of the WPA to include recreational values (swimming, fishing, walking, boating) and scenic views (open space, visual linkage to public ways)

▲ Establish setbacks for construction activities near coastal beaches, dunes and banks

This information is provided courtesy of McGregor & Shea Attorneys at Law, P.C.

Wetland protection bylaws are adopted at town and city council meetings as permitting mechanisms, and are administered and enforced by the conservation commission. So, if a proposed project involves alteration of a protected area, the developer will not be permitted to execute the project unless she can demonstrate that the area does not serve the purpose described in the bylaw.

Use of nonzoning bylaws is an effective wetland protection strategy, not only because of its exacting nature, but also because it employs the conservation commission in a permitting process with which it is already familiar. Since the commission understands what wetlands are and why they are important, towns can gain greater environmental protection, without creating an additional town agency.

However, one problem with bylaw implementation is that each permit requires a written decision by the conservation commission, which necessitates extensive review to verify that the proposed work will be consistent with the bylaw, or to provide evidence for permit denial.

Perhaps the most significant drawback of using wetland protection bylaws is that, as a permitting process, it does not result in absolute building setback distances from wetlands. However, this weakness is the zoning bylaw's greatest strength.

Zoning protection can be absolute

If a town is seeking to protect its wetlands by controlling development within specific proximities of wetland resources, it may want to consider adopting a wetland protection

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Conservation Commissioner: "It's not a glory job"

When it comes to wetland protection, local volunteer conservation commissioners are on the front line, since they are responsible for administering and enforcing the Wetlands Protection Act (WPA). But the growing scarcity of development-appropriate land and extremely technical and often unclear regulations have made this job an increasingly difficult, complex and time-consuming one to perform.

Most conservation commissioners have no formal environmental or legal training, and many commissions even lack secretarial support. Despite this, conservation commissioners are responsible for making weighty land use decisions by applying nearly a hundred pages of regulations to detailed engineering plans, hydrologic calculations, wetland delineations and wildlife habitat assessments.

And when it comes to administering the WPA in small towns where "everyone knows everyone," the commissioner's role becomes even more challenging. Says Massachusetts Association of Conservation Commissions (MACC) President and Bourne Conservation Commissioner Bob Grey, "Most conservation commission people understand that their major responsibility is wetlands protection... but since commissioners are all appointed, politics are a part of the process from the very beginning.... A lot of towns strive for a balance of pro-environment and pro-development members, but you don't need these extremes. What you need is a person that can sit in judgement and honestly evaluate a project according to the law."

Unfortunately, this is not always as easy as it sounds; no one likes to be told what they can and cannot do on their own land — especially in New England, the birthplace of "home rule." As Rochester Conservation Commissioner Georgia Chamberlain points out, "Conservation commissioners are not looked upon favorably by the townspeople. They think that the conservation commission is there to prohibit them from carrying out their projects."

But, Grey maintains that, "Enforcement [of the Wetlands Protection Act] is critical. Your [the commissioner's] responsibility is to protect the general public by protecting the public interest that wetlands provide — not the rights of the individual landowner."

The need to educate as well as rule

In tackling these issues, all conservation commissioners interviewed cited a need to educate as well as rule; to help proponents understand that consistent, even-handed application of the Wetlands Protection Act is in everyone's interest because it not only minimizes adverse environmental impacts but also is less likely to cause controversy, delay and cost.

Says Marion Conservation Commissioner Dennis Luttrell, "Both commissioners and proponents need to be educated on the science behind the regulations. For example, you need to explain to an applicant that you wouldn't be doing him any favors by allowing him to build an unelevated house in the velocity zone — you need to explain the potential ramifications such as contaminated water supplies or decreased property values."

One educational tool that several conservation commissioners felt would improve their wetland protection efforts is a town wetland map, "so people would know where their wetlands are [before proposing a project]," says Marion Conservation Commissioner Barbara Burr. "It would not replace field work, but would take some of the pressure off when deciding where a wetland edge is."

Perhaps one of the most effective ways to improve Wetland Protection Act administration is to hire an agent, and the Buzzards Bay Project and Buzzards Bay Action Committee are currently working together to develop a grant program to fund such a position to be shared by two or more Bay towns.

Says one conservation commissioner, "an agent can serve to insulate the board from politics; decisions can be less personalized, more based on facts, when recommendations are made by a neutral third party who's professionally trained in environmental regulations." In addition to performing research and making recommendations, agents can also monitor compliance to help prevent violations, and take on administrative tasks, so that commissioners can have time for activities such as land acquisition or other tasks included in their town open space and recreation plan.

However, with an agent, warns Burr, "It's easy for a board to get lazy and become a rubber stamp.... I'm not opposed to agents but it's a tool that must be used right." Indeed, adds Grey, "Agents can be of tremendous value for all towns, but Commissions have to remain involved as the decision maker — and from the very start, clearly outline their respective roles to the agent."

What's in it for me?

So what's the best thing about being a conservation commissioner? Comments Grey, "it's having the opportunity to educate the public about environmental protection." And the worst thing? All commissioners interviewed cited large time commitments, and this sentiment, as expressed by Burr: "It's not a glory job. No one ever says thank you... unless they want something."

zoning bylaw.

Zoning bylaws can work in a variety of ways. For example, a zoning bylaw may require that a specific distance exist between any proposed structure and wetland areas, or as mandated by the town of Truro's zoning bylaw, require that a given percentage of a building lot be upland (non-wetland area.)

Rochester Conservation Commission members (R to L) Bruce Maksy, Michael Soares and Georgia Chamberlain meet with Buzzards Bay Project intern John Rockwell to draft a wetland protection bylaw.

Zoning provisions are adopted at city council or town meetings. When adopting a zoning bylaw, municipalities usually also adopt an "overlay district" map to illustrate exactly where the zoning boundary lies. In most towns, zoning bylaws are administered and enforced by the building inspector and variances are handled by the zoning board of appeals.

The advantage of wetland protection by zoning bylaw is that development restrictions are nearly absolute and can not be challenged by a permitting process. However, administration of these provisions can be difficult since the building inspector's office is not equipped to determine if applicant-submitted wetland delineations are accurate. Additionally, town officials that enforce zoning regulations usually lack the training to understand what role wetlands play in the ecosystem, and the need for wetland protection. Zoning bylaws are also often difficult to pass since they can limit use of private property and require a two thirds majority vote. All these factors combine to make the wetland protection zoning bylaw a potent, but rarely-used tool.

Clearly, there are important advantages and limitations to using either zoning or nonzoning bylaw strategies to protect wetlands. Both wield a power to protect that should not be underestimated. But, cautions Wetland Consultant John Rockwell, "Whatever strategy is selected, zoning, non-zoning, or both, it will only work if it's implemented. A little thought into how your town's boards operate now, can make a difference as to whether or not wetland protection strategic decisions will payoff in the future."

Editorial and research contributors: McGregor and Shea Environmental Attorney Matthew Mitchell of and Wetland Consultant John Rockwell.

Wetland Delineation: the bottom line in protection

In Massachusetts, the Wetland Protection Act and local bylaws provide substantial environmental protection for wetland areas. However, delineating which areas are subject to these laws is perhaps one of the largest areas of dispute in wetland protection. In fact, it is not uncommon for wetland specialists to differ in the placement of a wetland line by thirty feet or more.

Incorrect delineation is not merely an area of academic contention — it is also one of the greatest causes of wetland loss, since wetland delineations are used by several local offices in making development and other land use and permitting decisions. Wetland delineations are relied upon by: conservation commissions in Wetland Protection Act administration, boards of health in determining septic system setback distances from wetlands, planning boards in subdivision plan evaluations, and building inspectors when enforcing wetland zoning bylaws.

Despite the vital importance of accurate wetland delineation, conservation commissioners are not required to use or learn any specific delineation methodology, and until recent years there's been little consensus on delineation standards. So how is a town board composed of lay people to decide if an applicant-submitted wetland delineation is correct? Fortunately, there are two quantitative methods that have been accepted as appropriate by Department of Environmental Protection Administrative Law Judges. Below, Wetland Consultant John Rockwell describes both methodologies.

The Sanford Method

This method is the simpler of the two most reliable wetland delineation methods used today. Using this technique, one can determine if a wetland boundary has been accurately marked (as indicated by bright orange "flags") by looking in the area uphill from the wetland flag and recording all the trees present in a 15 by 30 foot area, all the shrubs present in a 10 by 10 foot area, and all the herbaceous plants within a three by three foot area. These plants are then separated into wetland and upland groups, with the ratio of the wet and dry groups expressed as a percent. For example, if the ratio of wetland trees to upland trees is 2:1, then the wetland trees would be recorded as comprising 66% of the tree layer.

Once the percent of wetland plants for each plant category has been recorded, the wetland percentages for the tree, shrub and herbaceous layers are averaged to determine the mean value. If the mean value is less than 50% for the area immediately adjacent to the upland side of a wetland flag, the flag has been properly placed.

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In the forested wetlands of southeastern Massachusetts, this technique is appropriate 90% of the time, since commissioners usually see only a limited variety of plants and trees, and can therefore easily identify a site's vegetation. (i.e.: you don't have to be a botanist to use it.)

The Michener Method

For sites that have less common wetland plants or that include an odd mixture of wetland and upland plants, the Wetland Site Index (WSI), or Michener Method, may be appropriate. Like the Sanford method, the Michener method utilizes a numerical equation to determine whether or not an area is a wetland by computing the percentage of wetland plants in a study area. Although it is somewhat more complicated and time consuming, this method can be more accurate in delineating a wetland edge.

To use this technique, the WSI of a site is determined by multiplying the estimated percentage of each plant found in the study area by its wetland indicator status number (as assigned by the United States Fish and Wildlife Service, through the National Wetland Inventory Project.) One then computes the mean wetness value of all plants found to determine the study area's WSI. If the WSI is greater than 0.50, then the area is a wetland.

Although the Michener method will require additional practice, both techniques can be learned in separate one-day training courses which are offered periodically by the Massachusetts Association of Conservation Commissions (MACC). As long as enough original vegetation is present in the project area, one of the above two delineation methodologies is likely to be appropriate. If not, other delineation methodologies which rely upon assessments of other components such as soil or hydrology, should be used. For more information, contact the MACC at 617-489-4930.

John Rockwell teaches wetland delineation classes for the MACC and is currently a Buzzards Bay Project intern.

Wetland replication–it's nothing like the real thing

"Nature is not only more complex than we know; it may be more complex than we can know." Perhaps no words more aptly describe the reason for wetland replication failure than these by Henry David Thoreau.

Indeed, a naturally occurring wetland is a dynamic ecosystem of plants, animals, soils, topography and hydrology that has taken thousands of years to evolve. It is unrealistic to expect that anyone can fully understand all of its complex functions—much less, artificially replicate such an area. However, there are circumstances in which a conservation commission may permit wetland destruction in exchange for the creation of a "new wetland."

In Massachusetts, when wetland creation is allowed to occur, it is usually done through a Wetland Protection Act regulation which requires wetland replication in exchange for permission to fill up to 5,000 square feet of bordering vegetative wetland (wetlands bordering freshwater bodies or salt marshes). However, it is important to note that while a commission may allow wetland filling and replication, it is not obliged to. And certainly, there's good reason to deny such a permit request; according to the Massachusetts Association of Conservation Commissions (MACC), less than half of the wetland replication projects attempted in the state have been even partially successful.

Because of this low success rate, the Department of Environmental Protection (DEP) recommends that wetland replication only be done as a last resort. Alternatives, such as resiting structures, should be exhausted before even considering wetland replacement as an option. But if it is to be considered, the potential impacts of natural wetland destruction and the functional goals of the replicated wetland must be carefully evaluated. Scientists suggest that questions to be addressed in wetland replication permitting decisions include: What original wetland functions will be lost? What functions are the most crucial to replicate, and what are the chances of successfully accomplishing this? Will the artificial wetland be successful over the long-term without intensive and costly maintenance? Should we require that the artificial wetland be successfully functioning before allowing for destruction of the original area, and should valuable uplands be converted to questionably valuable artificial wetlands?

The commission may also want to draft a list of circumstances in which wetland destruction and replication is prohibited, such as in areas where groundwater quality and/or recharge capacities will be affected, or in areas where unique ecological systems would be disturbed.

Should a commission elect to permit a wetland replication project to proceed, Buzzards Bay CCMP recommendations advise that, given the high failure rate of replicated wetlands, replicated areas should be at least twice as large as the original wetland area in order to better achieve a true "no net loss" of wetlands.

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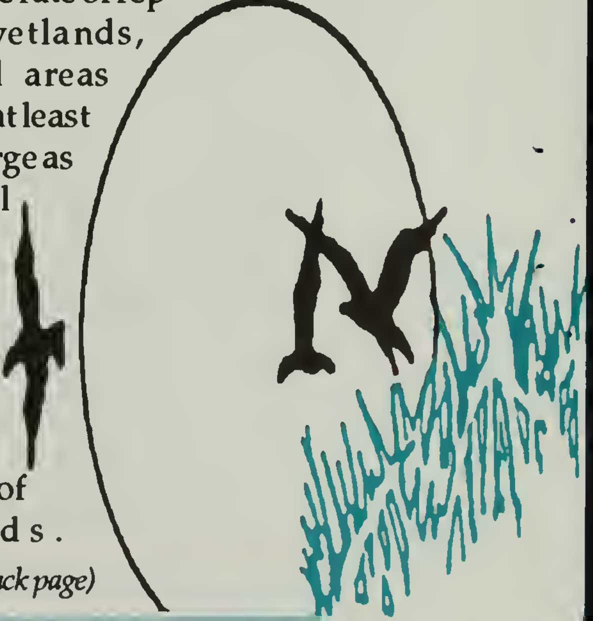

BAY BRIEFS

Project/BBAC allocate funds

On March 9, the Buzzards Bay Project Steering Committee voted to approve a preliminary Buzzards Bay Comprehensive Conservation and Management Plan (CCMP) implementation budget proposed by the Buzzards Bay Project and Buzzards Bay Action Committee.

Last fall, Congress appropriated $400,000 to help implement the estuary protection plan developed by the Project. The Project will administer the majority of these funds, with $57,500 being administered by the BBAC for oil spill clean up and septic system management.

This funding will be allocated to finance technical assistance and municipal grant programs as follows:

$20,000	Oil spill containment
37,500	Establishment of a septic system management program
25,000	Financing for a regional conconservation district agent
20,000	Boat pump-out programs
127,500	Stormwater remediation
15,000	Stormwater management
25,000	Repair of herring runs
25,000	Coastal resource mapping
15,000	Nitrogen management
25,000	Coalition's Citizen's Local Government Monitoring Program
30,000	Citizens' Water Quality Monitoring Program sample analysis
35,000	Wetland technical assistance to municipalities

Currently, the Project and the BBAC are working together to develop criteria for selecting municipal grant recipients.

Citizens' water quality monitoring results released

The Project and the Coalition for Buzzards Bay have released the first water quality test results based on data collected last summer by Citizens' Water Quality Monitoring Program volunteers. These results are being hailed as an important step in prioritizing areas for nonpoint source pollution management, as recommended in the Buzzards Bay CCMP

Water quality tests evaluated nitrogen loading (as indicated by oxygen levels), in 30 Buzzards Bay embayments. The stations with the worst (lowest mean oxygen concentrations) were Barlows Landing (Bourne), New Bedford Inner Harbor, and Upper Aucoot Cove (Marion). The stations with the best (highest) oxygen concentrations were Megansett Harbor (Falmouth), Planting Island Cove (Marion), and West Falmouth Harbor.

17 of the 89 sites monitored were also ranked on a "Eutrophication Index" which was based on measurements of water transparency, chlorophyll, nitrogen and oxygen concentrations. The embayments with the worst scores on this index were the Westport River's upper East Branch, Apponagansett Bay and Sippican Harbor.

The Project is continuing to review these results and is developing another index to rank the overall water quality of each embayment, based on shellfish bed closure data.

Replication, *Continued*

Additionally, experience has shown that oversight of replication projects during and for many years after construction is crucial to improving the chances of replication success.

Even under optimum circumstances, wetland replication success relies on an imperfect science. Before making any wetland replication decisions, commissions would do well to heed the advise of DEP 1983 regulations which state that, "the interests of the [Wetland Protection] Act cannot be protected other than by leaving the existing wetland intact".... Or to put it more bluntly, if it's not broken, don't fix it.

BAY WATCH

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Towns can not runoff from stormwater pollution

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April showers bring May flowers, but that's not all they bring. With rainfall also comes stormwater runoff to Buzzards Bay, carrying fecal bacteria, sediments, heavy metals, nutrients, and anything else that happens to find its way into the stormdrain system.

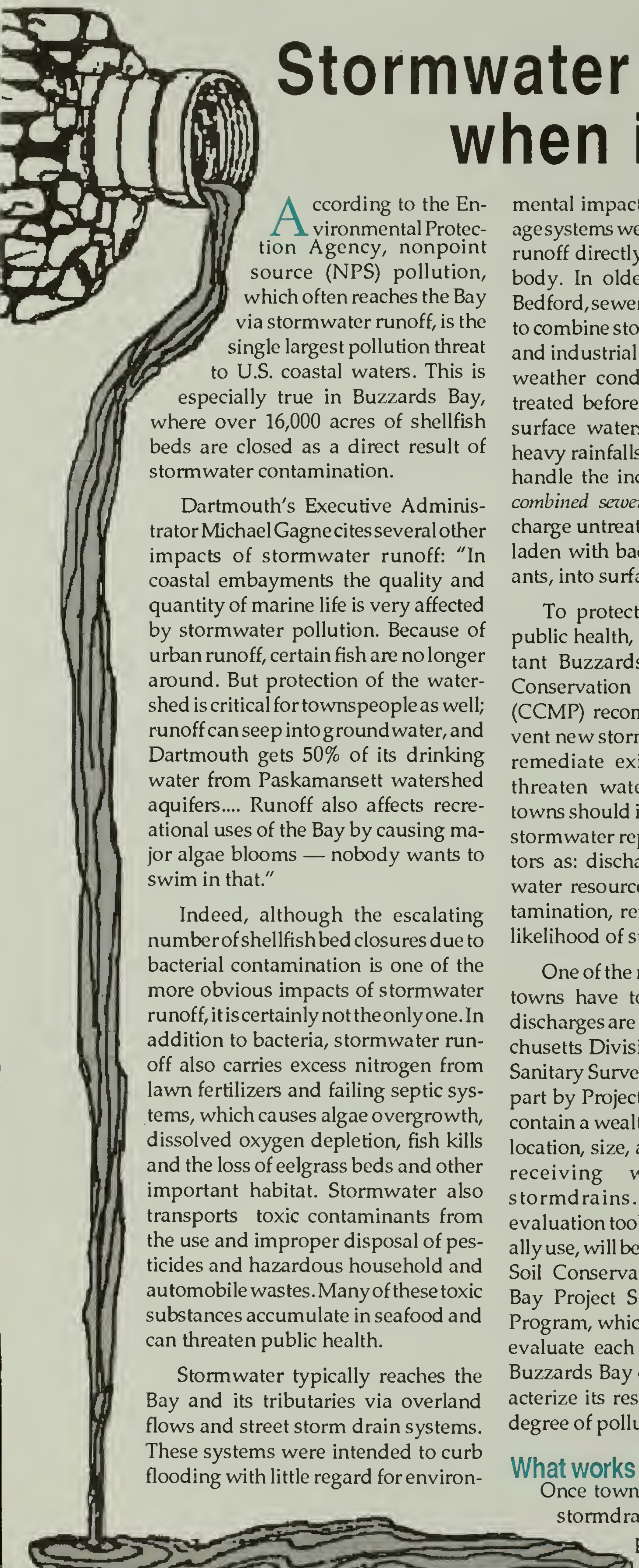
Stormwater is rain runoff from urban streets, developments, and agricultural lands that enters surface waters via over-land flows and storm sewers. Fertilizers, pesticides, animal wastes, engine oil, and detergents are just a few ingredients in the cornucopia of stormwater pollution. Once it enters the Bay and its tributaries, stormwater is a major source of bacterial, nitrogen and toxic contamination.

Among the environmental impacts of uncontrolled stormwater runoff are: seafood and water contamination, habitat destruction, and excessive algae growth. But the costs of stormwater pollution are economic as well. Beaches closed from bacterial contamination and waters strewn with algae overgrowth are hardly tourist dollar magnets. But even more significantly, stormwater is considered the primary source of bacteria currently responsible for closing over 16,000 acres of Buzzards Bay shellfish beds — that translates into an annual economic loss of about $24 million to Buzzards Bay communities! With numbers like these, towns can no longer *run off* from stormwater pollution; as recommended in the Buzzards Bay Comprehensive Conservation and Management Plan (CCMP), they need to begin remediating existing stormwater problems. And with the cost for street stormwater remediation systems often exceeding $100,000, they also need to seriously consider what can be done now, at little or no cost, to prevent future stormwater discharges.

In this issue of Bay Watch, we'll investigate what municipalities need to consider to effectively manage their stormwater problems. How can towns save money by preventing future stormwater problems? What criteria should communities use to prioritize remediation efforts? Once a stormwater problem is targeted for remediation, what *best management practice* is most appropriate to solve it? And what can farmers do to reduce agricultural runoff while also boosting farm productivity? For answers, we consulted municipal officials, environmental planners, soil conservationists, and Bay area farmers. To understand some of the issues of stormwater management from their perspectives, please read on.

INSIDE . . .

- The bottom line: What will it take to solve urban stormwater problems?
- Eye on agricultural runoff: how two Bay farmers keep contaminents on the farm
- First regional conservation district is declared
- Rochester wetland bylaw passes



Stormwater pollution: when it rains it pours

According to the Environmental Protection Agency, nonpoint source (NPS) pollution, which often reaches the Bay via stormwater runoff, is the single largest pollution threat to U.S. coastal waters. This is especially true in Buzzards Bay, where over 16,000 acres of shellfish beds are closed as a direct result of stormwater contamination.

Dartmouth's Executive Administrator Michael Gagne cites several other impacts of stormwater runoff: "In coastal embayments the quality and quantity of marine life is very affected by stormwater pollution. Because of urban runoff, certain fish are no longer around. But protection of the watershed is critical for townspeople as well; runoff can seep into groundwater, and Dartmouth gets 50% of its drinking water from Paskamansett watershed aquifers.... Runoff also affects recreational uses of the Bay by causing major algae blooms — nobody wants to swim in that."

Indeed, although the escalating number of shellfish bed closures due to bacterial contamination is one of the more obvious impacts of stormwater runoff, it is certainly not the only one. In addition to bacteria, stormwater runoff also carries excess nitrogen from lawn fertilizers and failing septic systems, which causes algae overgrowth, dissolved oxygen depletion, fish kills and the loss of eelgrass beds and other important habitat. Stormwater also transports toxic contaminants from the use and improper disposal of pesticides and hazardous household and automobile wastes. Many of these toxic substances accumulate in seafood and can threaten public health.

Stormwater typically reaches the Bay and its tributaries via overland flows and street storm drain systems. These systems were intended to curb flooding with little regard for environmental impacts, so streets and drainage systems were designed to discharge runoff directly into the nearest water body. In older cities, such as New Bedford, sewer systems were designed to combine stormwater with domestic and industrial wastewater. Under dry weather conditions, this effluent is treated before being discharged into surface waters. However, following heavy rainfalls, sewer facilities cannot handle the increased volume, so the *combined sewer overflows (CSOs)* discharge untreated wastewater, heavily laden with bacteria and other pollutants, into surface waters.

To protect the environment and public health, one of the most important Buzzards Bay Comprehensive Conservation and Management Plan (CCMP) recommendations is to prevent new stormwater discharges and remediate existing discharges that threaten water resources. Initially, towns should inventory and prioritize stormwater repairs based on such factors as: discharge size, proximity to water resources, the amount of contamination, remediaton cost, and the likelihood of success.

One of the most valuable tools that towns have to evaluate stormwater discharges are the results of the Massachusetts Division of Marine Fisheries Sanitary Survey, which was funded in part by Project grants. These surveys contain a wealth of information on the location, size, and probable impact to receiving waters of existing stormdrains. Another important evaluation tool that towns can eventually use, will be the results of the USDA Soil Conservation Service/Buzzards Bay Project Subwatershed Ranking Program, which is being conducted to evaluate each watershed within the Buzzards Bay drainage basin to characterize its resources, values and the degree of pollution.

What works

Once towns have evaluated their stormdrain problems, actual repairs can begin, based on availability of resources. Although no single stormwater technique can solve all runoff problems, the Project has funded the demonstration of several best management practices (BMPs) which, says Project Environmental Planner Dave Janik, "can remove bacteria and significantly reduce the concentrations of heavy metals, hydrocarbons and other pollutants before the effluent reaches the Bay."

The first of these projects employs the BMP of *infiltration* to protect Buttermilk Bay shellfish beds from the stormwater of Electric Avenue in Bourne. It functions by diverting stormwater into a *particle separator* to remove effluent solids. The stormwater is then further treated in several leaching chambers that allow it to percolate through the surrounding soil. Other kinds of infiltration devices include leaching catch basins, seepage trenches and porous pavement.

A *constructed wetland system is* another kind of BMP which the Project is currently designing in Spragues Cove, Marion. This system works by removing stormwater sediments and some pollutants in a *settling basin.* The effluent then passes into a pond and artificial wetland where the contaminants can be degraded through biological processes before being discharged into the Bay.

The bottom line

Depending on site and receiving water conditions, either or both of the above BMPs can be used to protect water quality. But unfortunately, funding difficulties often prevent much-needed stormwater remediation from proceeding. Says Bourne Selectman Jim Malatos, "The bottom line is money. If towns can not capture the funding, it's a difficult sell at town meeting when you have a choice between correcting drainage or putting two more policemen on duty. While everyone agrees on the need [for pollution control], when it comes to total cost, it's a problem. Most people have

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Letter from the Project Manager

Over the past two years, a lot has happened at the Buzzards Bay Project as we moved from development to implementation of our CCMP. Along the way, we have won acclaim and become recognized leaders in the advancement of innovative environmental protection strategies. We have brought state and federal grant money to Bay municipalities, and have strengthened our ties with the two key environmental organizations, the Buzzards Bay Action Committee and the Coalition for Buzzards Bay. Our municipal grant program and the joint Project/Coalition Citizens' Water Quality Monitoring Program are sparkling examples of this effort.

During this period of change, you've learned about many of our successes, challenges and the environmental issues behind them through our newsletter. However, as we focus on CCMP implementation, we will be spending more of our limited funding on grants and technical assistance to Buzzards Bay municipalities, and less on outreach activities. It is therefore with great regret that we will be discontinuing our newsletter and loosing our Public Information Specialist, Mara Altman. Since Mara joined the Project staff, she has worked hard to ensure the success and excellent quality of Baywatch *and other outreach materials, and has been dedicated to the Project's goals. We will certainly be challenged by her departure, but we wish Mara the best as she embarks on a new business venture as an environmental communications consultant.*

Although we are discontinuing our newsletter, we'll still keep you informed about CCMP implementation progress through other venues, such as regular local newspapers articles and cable access channels. There, you can follow our continuing efforts as well as our new initiatives to protect wetlands and reduce the use and production of toxic materials. Be assured that we are still working with your towns harder than ever, to achieve the goals in the CCMP.

Sincerely,

Joseph E. C

Project Manager

BAY BRIEFS

Project and BBAC fund regional conservation agent

The Buzzards Bay Project and Action Committee have announced the award of a $25,000 grant to the municipalities of Marion, Rochester and New Bedford to hire a regional conservation agent. Under the authority of the towns' conservation commissions, the agent will enhance Wetland Protection Act enforcement by performing administrative and permitting duties and utilizing skills in hydrology, geology, botany and engineering. The municipalities will provide a match of $16,900 in benefits and support for this position in the program's first year, and are committed to fully funding the program for a minimum of two additional years.

Rochester wetland bylaw passes

On May 17, the Rochester wetland protection bylaw was overwhelmingly approved at Town Meeting to improve conservation commission review of proposed work taking place on or near wetland areas. The bylaw was drafted in a cooperative effort by the Project and the Rochester Conservation Commission.

The new regulations strengthen state Wetland Protection Act (WPA) provisions by enabling the commission to: require that proponents provide specific permit application information, assess consultant review fees for large projects, obtain a bond or security deposit to ensure that orders of conditions will be met, notify abutters of proposed projects, and extend protection to isolated, 5000-square feet or larger wetland parcels, which are not currently protected by the WPA.

Osuch elected BBAC Chairman

On May 12, the Buzzards Bay Action Committee (BBAC) elected Fairhaven Executive Secretary and civil engineer Jeff Osuch to Chair the municipal environmental alliance. The former BBAC Vice Chairman is known for his expertise in town government and his ability to work with a broad spectrum of constituencies.

Osuch has been a BBAC member since the group of municipal leaders was formed in 1987 to help implement the CCMP through regional cooperation and adoption of effective policies and bylaws. He also formerly headed the Fairhaven Department of Public Works and is a recipient of the BBAC 1991 Meritorious Achievement Award for exemplary local efforts to protect Buzzards Bay resources. Osuch replaces outgoing Chairman Ted Pratt who was praised by BBAC members for his dedication to municipal Bay protection efforts.

Water Quality Monitoring Program in second season

The Citizens' Water Quality Monitoring Program has begun its second season of testing. This year the Program is expanding its nutrient monitoring and has begun bacterial sampling in selected embayments. The Program is nearly fully staffed with 80 monitors, but additional volunteers are needed for the Weweantic and Wankinco Rivers in Wareham and Taylor's Point, Bourne. Backup monitors are also needed throughout the Bay area.

The Program is a joint effort by the Project and the Coalition for Buzzards Bay. The collected data will eventually be used to evaluate Bay water quality. For more information, contact Program Coordinator Eileen Gunn at 759-1440.

Project launches toxic use reduction program

The Project has begun its two and a half year initiative to help Bay area industries reduce their use of toxic substances. Through workshops, educational materials and on-site training, the program will help participating companies minimize and prevent toxic discharges while eliminating the high costs of toxic waste management.

The program is being funded by a $198,000 EPA grant, with technical assistance being provided by the Massachusetts Office of Technical Assistance. The effort is being coordinated by Frederick Kalisz, who is also the New Bedford City Council President.

the attitude of 'fix it, but don't charge me.'"

It's that kind of attitude, says Buzzards Bay Action Committee Executive Director Dennis Luttrell, "that can destroy our economic base. The real bottom line is that towns can't afford *not* to remediate their stormwater problems. The economy of this region is based on the Bay being a clean, usable resource. When the water is polluted it doesn't just affect the shellfisher — it also negatively impacts real estate values, recreational industries, and employment and tax rates."

To help towns begin to address their stormwater problems, the Buzzards Bay Project will be offering limited municipal grants to help fund at least two to three remediation projects over the coming year, but of course, this is only a very small portion of what's actually needed. Says Luttrell, "towns need to reassess their spending priorities and press their state and local representatives for funding to protect their resources."

As recommended in the CCMP, towns should also protect their resources from runoff contamination with measures that cost little or no money. Says Project Manager Joseph Costa, "Towns can actually save money by preventing stormwater problems before they occur. The most effective way to do this is by adopting bylaws requiring that all new developments use BMPs to prevent any new untreated surface discharges." To assist towns in this effort, the Project is currently developing a model bylaw which requires that all stormwater from new developments be retained and treated on site. This can be achieved by employing the BMPs described above and through simple measures such as minimizing paved areas and requiring that roof and driveway runoff be directed into vegetated areas where it can naturally infiltrate the soil. Individuals can also help manage stormwater through the wise use and proper disposal of pesticides, fertilizers, motor oil and other harmful materials.

Clearly, solving our stormwater problems will take more than money. Says Costa, "Although funding is required to repair existing stormwater discharges, the ability to think proactively about stormwater management is also crucial. Steps taken now to prevent future stormwater problems cost nothing and can save towns hundreds of thousands of dollars... and help to preserve a quality of life for generations to come."

DOING IT ONE BAY AT A TIME... BUTTERMILK BAY CLEANUP CONTINUES

The joint Buzzards Bay Project/Town of Bourne, Electric Avenue stormwater treatment project to protect Buttermilk Bay clearly illustrates the need for comprehensive stormwater management planning.

Just one year after this system was installed, its water quality benefits were almost counteracted when the Town of Wareham, which shares Buttermilk Bay with Bourne, paved some gravel roads and began diverting the stormwater from these surfaces directly into the Bay. After concerned residents notified the Project and the Coalition for Buzzards Bay about this work, both groups approached Wareham about the need for stormwater treatment. Although this would be expensive, the town recognized that the loss of Buttermilk Bay shellfish areas would be even more costly. So, with technical assistance from the Buzzards Bay Project, Wareham agreed to finance and install 13 leaching catch basins to treat the new stormwater discharges.

The Project and Wareham have since developed a closer relationship and are now working together to remediate another stormwater discharge at Broad Marsh River. Later this year, the Project is hoping to work with both Bourne and Wareham to develop a strategy to eliminate all major stormwater discharges to Buttermilk Bay.

What's good for the farm is good for the Bay

According to farmer Linda Rinta, "Whenever something is inefficient it's not good for the farm and it's not good for the environment. You use too much energy and too many inputs." Rinta, a cranberry grower and the Agricultural Chairperson of the Plymouth County Conservation District, is one of a growing number of Bay area farmers (primarily dairy and cranberry) who are improving production while reducing the amount of potential contaminants they discharge into the Buzzards Bay drainage basin.

Of the Bay's 246,000-acre watershed, approximately 42,800 acres are occupied by farm operations, which are the primary source of nonpoint source (NPS) pollution in some embayments. This pollution includes excess nutrients, sediments and other materials from chemical fertilizers, manure, and pesticides. When agricultural pollutants are not properly managed, they are often carried to the Bay in stormwater runoff. If agricultural runoff is left uncontrolled, nutrients and animal waste fecal bacteria can contaminate surface and groundwater, close shellfish areas, promote excess algae growth, and decrease water oxygen levels. Wetlands can also be damaged by agricultural sediments which can transport excess chemical contaminants and pesticides that can change habitats and cause fish kills.

Fortunately, water quality can be protected from agricultural runoff by employing *best management practices (BMPs)* that maximize farm productivity while keeping agricultural chemicals and nutrients where they belong — on the farm. Thanks to a variety of technical, educational, and cost sharing programs offered by agencies such as the USDA Soil Conservation Service (SCS) in cooperation with the Buzzards Bay Project, BMPs, including integrated pest management, animal waste storage and utilization, and erosion control techniques, are now being employed throughout the Bay area. All of this is good for the farm, which in turn, is also good for the Bay.

Although the challenges that cranberry and dairy farmers face in reducing agricultural runoff and improving efficiency are different, their determination to seek solutions is the same. Here are their stories.

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Life on the bog

Straddling the Wareham and Carver town lines, Linda and Paul Rinta's cranberry bogs occupy 90 acres of the Buzzards Bay drainage basin and are bordered by about 400 acres of wetlands, woodlands and open fields. Such an environmentally sensitive area is not an unusual location for cranberry bogs which are, in fact, a naturally occurring type of wetland vegetation. However, working in this area has made Rinta keenly aware of the challenges of "responding to what nature dishes out, as opposed to trying to manage nature," she says.

To respond to nature in a way that also boosts productivity, Rinta follows a conservation plan based on BMPs and recommendations contained in an Inventory and Evaluation (I & E) performed on her farm (see footnote). Perhaps her most critical challenge is that of controlling pests while safeguarding water quality. Challenging, yes, but not impossible, says SCS Soil Conservationist Bernadette Taber. "Part of proper bog management is maintaining the ability to hold water, and whatever pesticides are used, within the bog system to prevent offsite transport of potential contaminants. If integrated pest management (IPM) is used, the risks of agricultural runoff are further lowered."

IPM is the BMP of utilizing alternative techniques and substances to reduce the use of more harmful chemical pesticides. Traditional pesticides are used only when predefined levels of economic damage are reached, and then in usually less concentrated or less toxic formulas.

Getting the bugs out

Key to successful IPM is meticulous inspection of crops and pests to ensure that the most appropriate substance is applied at the optimum time and amount. "The objective," says Rinta, "is to get more out of your property by putting less into it." Rinta practices several IPM techniques, which she says, require "constant vigilance and monitoring."

Indeed, Rinta and her husband literally work night and day, "sweeping for insects" with nets and counting insect eggs to identify and assess the infestation by both nocturnal and daytime pests. Every three days they "scout and map" all their bogs to record any developing pest problem. Crop inspections are equally meticulous and take into account the number and size of blooms and berries, the overall condition of plants, and plant tissue sampling.

Although the Rintas primarily rely on reduced or safer pesticide materials to control pest problems when necessary, they are also experimenting with the use of predator insects to further reduce their chemical use. This is a complex process in which growers practically have to become entomologists to match the peak "flight times" and reproductive cycles of both the predator and the pest target so that the predator is released when it is most likely to destroy both the target pest and its offspring.

In addition to IPM, another important BMP that the Rintas employ is *rotational sanding.* This technique reduces fertilizer and pesticide needs by keeping plants

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Less is more at Pine Bridge Farm

At first glance, James Tripp's Pine Bridge Farm appears to be an average dairy farm. Situated in the Buzzards Bay drainage basin and not far from the Westport River, the farm is home to about 150 Holstein cows. The herd produces about 9,000 pounds of milk a day and enough manure to fertilize about 200 acres of feed corn and 20 acres of sweet corn and pumpkins, and, one would think, enough nutrients and fecal coliform bacteria to contaminate any nearby water body. But in fact, very few agricultural pollutants ever leave Pine Bridge Farm — not since Tripp took steps to develop a conservation plan which includes best management practices (BMPs) to manage the nutrients and pesticides used on his farm.

As a result, he's growing more corn, spending less time managing manure, making more productive use of his land, and using less chemical fertilizers and pesticides. These benefits represent a substantial investment of time and money. When asked why he decided to take such proactive steps, he cited the educational and grant programs that were made available to him and shrugged, "We wanted to do it before someone told us we had to."

Waste... NOT.

The cornerstone of Tripp's conservation plan is an *animal waste storage and utilization system* which allows him to maximize the use of manure as the primary fertilizer for his corn crop. This reduces the need for chemical fertilizers and, by containing animal wastes, he's preventing a major source of fecal bacteria and nutrients from entering surface and ground waters.

To determine the best animal waste management strategy, Tripp worked with SCS to assess how much runoff was coming from his building rooftops, milk house, and feedlots. SCS then proposed a variety of plans which focused on diverting clean water (such as rain water and roof runoff) from barnyard wastes and a manure collection, storage, and spreading plan.

Tripp then purchased a slurrystore structure, a 101 foot by 14 foot tank which can store up to six months' worth of manure. Now he only spreads manure twice a year, in the spring and fall, when it's most needed. According to Tripp, the new system reduces the daily work load. "Before we could only store a couple of weeks' worth, so we had to collect it and spread it more often. Also, the slurrystore does not use as much land as conventional storage so the land can be used for other things.... We're growing a lot more corn than we used to; corn absorbs nitrates faster, is a good feed for cows and you get a lot of it per acre."

Since implementing this strategy, Tripp maintains that he's using very little extra fertilizer. To determine exactly how much extra fertilizer he does

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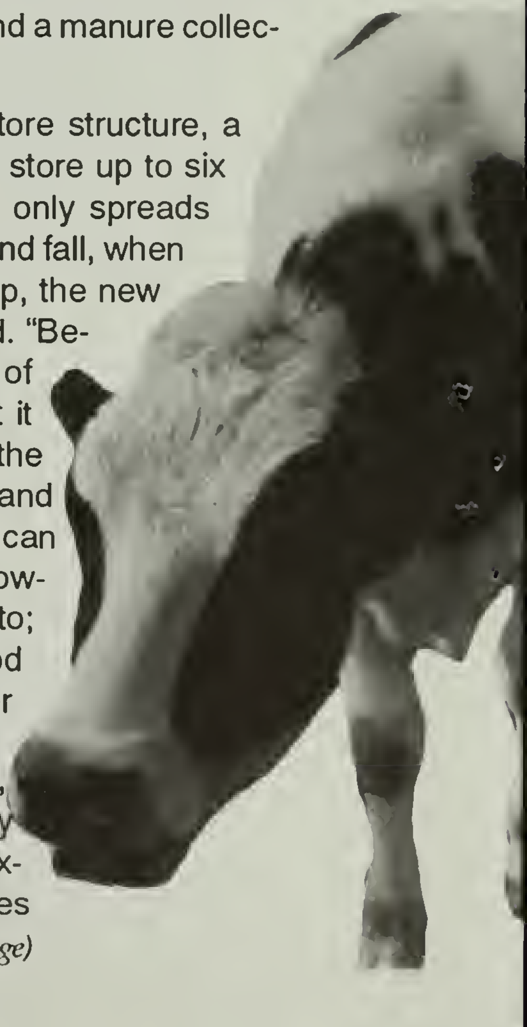

Cranberry, *Continued*

short, since large plants are not needed for cranberry growth. It is done by spreading sand on frozen bogs in the winter; as the ice melts, the sand covers plant vines to retard new growth and smother "leaf litter" insects.

Although the Rintas' I & E was generally favorable, it did point out several areas in need of improvement. For example, many of the edges of their bogs were subject to erosion, so to prevent sediment loss they have covered the edges with loam and seed grass. Additionally, the irregularly shaped areas of some of their bogs needed to be "squared off" as they were major sources of pests and weeds that could not be reached by maintenance machinery.

The most costly improvement indicated was sprinkler system repairs, since tests revealed an uneven water pressure. Uniform pressure is critical, since both water and chemicals are applied through this ground-level system. The idea is to apply the chemicals close to the crop to eliminate offsite drift and keep the "chemigated" water on the bogs until the chemicals have degraded. To prevent "overchemigation," the Rintas are now replacing faulty lines and connectors.

However, water quality protection does not stop at the bog. "When we talk about managing our inputs there are also inputs that we are the recipient of," comments Rinta, referring to the need to maintain buffer areas around bogs for protection from road runoff and development pollutants. Like many Bay area growers, the Rintas maintain at least four acres of upland for every acre in bog production. These areas are kept in a natural state as a buffer for the bog and for watershed and habitat protection.

Rinta maintains that the BMPs used in her bogs are crucial for both environmental and business reasons. "We depend on clean water. If we have dirty water we're dead. We can't grow cranberries with dirty water."

The Plymouth County Conservation District's I & E program is a site specific and confidential farm planning tool. For more information call: 508-947-7863.

Cow, *Continued*

need, Tripp has implemented a nutrient management plan with the help of the University of Massachusetts Cooperative Extension System. The plan takes into account each crop's nutrient requirements and the quantity of manure being applied. Later in the growing season, the soil is tested to see if enough nitrogen is in the ground to raise the crop. Chemical fertilizer is only added when necessary. Says Tripp, "Everyone used to think that when it came to fertilizer, 'more is better.' Now we realize that some of that fertilizer gets leached away."

Tripp applies a similar philosophy to pesticide use by employing *integrated pest management (IPM)* to limit pesticide applications to the minimum amount necessary for crop protection. To determine when pesticides are needed, the moths of his corn crop's major predator, the corn borer worm, are trapped and counted and the plants are assessed for damage. If the damage is below a specific threshold, pesticides are not used. Tripp maintains that, "Before, we'd usually have to spray every three days. Now we're saving money on excess spraying... and the less we handle pesticides, the better it is for us."

After the harvest, Tripp plants rye grass as a *cover crop* on his corn fields to reduce soil erosion over the winter. Cover crops help to keep soil in place and leave behind valuable nutrients after spring plowing.

Taken together, animal waste and nutrient management, IPM, and erosion control techniques are all examples of BMPs which can help make farming both environmentally *and* economically sustainable. Indeed, as SCS Soil Conservationist Bernadette Taber points out, these two interests are far from being mutually exclusive. "Water quality is not only an environmental issue — it's crucial to maintaining healthy crops and livestock. Hopefully as farmers come to realize their farms' impact on the resources they depend on, *best* management practices will someday become *standard* management practices."

BAY WATCH

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